

# SEQUENCE LISTING

<110> Robbins, Paul D.  
 Mi, Zhibao  
 Frizzell, Raymond  
 Glorioso, Joseph C.  
 Gambotto, Andrea

<120> IDENTIFICATION OF PEPTIDES THAT  
 FACILITATE UPTAKE AND CYTOPLASMIC AND/OR NUCLEAR TRANSPORT  
 OF PROTEINS, DNA AND VIRUSES

<130> AP32573-AAA 072396.0237

<140> TBD  
 <141>

<150> 60/151,980  
 <151> 1999-09-01

<150> 60/188,944  
 <151> 2000-03-13

<160> 99

<170> FastSEQ for Windows Version 4.0

<210> 1  
 <211> 12  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> random peptide library

<400> 1  
 Lys Arg Ile Ile Gln Arg Ile Leu Ser Arg Asn Ser  
 1 5 10

<210> 2  
 <211> 12  
 <212> PRT  
 <213> Artificial Sequence

<220>

FASTA format

<223> random peptide library

<400> 2

Lys Arg Ile His Pro Arg Leu Thr Arg Ser Ile Arg  
1 5 10

<210> 3

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 3

Pro Pro Arg Leu Arg Lys Arg Arg Gln Leu Asn Met  
1 5 10

<210> 4

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 4

Pro Ile Arg Arg Arg Lys Lys Leu Arg Arg Leu Lys  
1 5 10

<210> 5

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 5

Arg Arg Gln Arg Arg Thr Ser Lys Leu Met Lys Arg  
1 5 10

<210> 6

<211> 12

<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 6  
Met His Lys Arg Pro Thr Thr Pro Ser Arg Lys Met  
1 5 10

<210> 7  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 7  
Arg Gln Arg Ser Arg Arg Arg Pro Leu Asn Ile Arg  
1 5 10

<210> 8  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 8  
Arg Ile Arg Met Ile Gln Asn Leu Ile Lys Lys Thr  
1 5 10

<210> 9  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 9  
Ser Arg Arg Lys Arg Gln Arg Ser Asn Met Arg Ile  
1 5 10

<210> 10  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 10  
Gln Arg Ile Arg Lys Ser Lys Ile Ser Arg Thr Leu  
1 5 10

<210> 11  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 11  
Pro Ser Lys Arg Leu Leu His Asn Asn Leu Arg Arg  
1 5 10

<210> 12  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 12  
His Arg His Ile Arg Arg Gln Ser Leu Ile Met Leu  
1 5 10

<210> 13  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 13

Pro Gln Asn Arg Leu Gln Ile Arg Arg His Ser Lys  
1 5 10

<210> 14

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 14

Pro Pro His Asn Arg Ile Gln Arg Arg Leu Asn Met  
1 5 10

<210> 15

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 15

Ser Met Leu Lys Arg Asn His Ser Thr Ser Asn Arg  
1 5 10

<210> 16

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 16

Gly Ser Arg His Pro Ser Leu Ile Ile Pro Arg Gln  
1 5 10

<210> 17

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 17

Ser Pro Met Gln Lys Thr Met Asn Leu Pro Pro Met  
1 5 10

<210> 18

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 18

Asn Lys Arg Ile Leu Ile Arg Ile Met Thr Arg Pro  
1 5 10

<210> 19

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 19

Arg Gln Ile Lys Ile Trp Phe Gln Asn Arg Arg Met Lys Trp Lys Lys  
1 5 10 15

<210> 20

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 20

Ala Arg Pro Leu Glu His Gly Ser Asp Lys Ala Thr  
1 5 10



<400> 24

Arg Arg Gln Arg Arg Thr Ser Lys Leu Met Lys Arg Gly Gly Lys Leu  
1 5 10 15  
Ala Lys Leu Ala Lys Lys Leu Ala Lys Leu Ala Lys  
20 25

<210> 25

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 25

His Gly Trp Glx Ile His Gly Leu Leu His Arg Ala  
1 5 10

<210> 26

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 26

Ala Val Pro Ala Lys Lys Arg Glx Lys Ser Val  
1 5 10

<210> 27

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 27

Pro Asn Thr Arg Val Arg Pro Asp Val Ser Phe  
1 5 10

<210> 28

<211> 12



<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 28  
Leu Thr Arg Asn Tyr Glu Ala Trp Val Pro Thr Pro  
1 5 10

<210> 29  
<211> 13  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 29  
Ser Ala Glu Thr Val Glu Ser Cys Leu Ala Lys Ser His  
1 5 10

<210> 30  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 30  
Tyr Ser His Ile Ala Thr Leu Pro Phe Thr Pro Thr  
1 5 10

<210> 31  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 31  
Ser Tyr Ile Gln Arg Thr Pro Ser Thr Thr Leu Pro  
1 5 10

<210> 32  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 32  
Ala Val Pro Ala Glu Asn Ala Leu Asn Asn Pro Phe  
1 5 10

<210> 33  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 33  
Ser Phe His Gln Phe Ala Arg Ala Thr Leu Ala Ser  
1 5 10

<210> 34  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 34  
Gln Ser Pro Thr Asp Phe Thr Phe Pro Asn Pro Leu  
1 5 10

<210> 35  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library



<213> Artificial Sequence

<220>

<223> random peptide library

<400> 39

Phe Asp Pro Phe Phe Trp Lys Tyr Ser Pro Arg Asp  
1 5 10

<210> 40

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 40

Phe Ala Pro Trp Asp Thr Ala Ser Phe Met Leu Gly  
1 5 10

<210> 41

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 41

Phe Thr Tyr Lys Asn Phe Phe Trp Leu Pro Glu Leu  
1 5 10

<210> 42

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 42

Ser Ala Thr Gly Ala Pro Trp Lys Met Trp Val Arg  
1 5 10

<210> 43  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 43  
Ser Leu Gly Trp Met Leu Pro Phe Ser Pro Pro Phe  
1 5 10

<210> 44  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 44  
Ser His Ala Phe Thr Trp Pro Thr Tyr Leu Gln Leu  
1 5 10

<210> 45  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 45  
Ser His Asn Trp Leu Pro Leu Trp Pro Leu Arg Pro  
1 5 10

<210> 46  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 46  
Ser Trp Leu Pro Tyr Pro Trp His Val Pro Ser Ser  
1 5 10

<210> 47  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 47  
Ser Trp Trp Thr Pro Trp His Val His Ser Glu Ser  
1 5 10

<210> 48  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 48  
Ser Trp Ala Gln His Leu Ser Leu Pro Pro Val Leu  
1 5 10

<210> 49  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 49  
Ser Ser Ser Ile Phe Pro Pro Trp Leu Ser Phe Phe  
1 5 10

<210> 50  
<211> 12  
<212> PRT  
<213> Artificial Sequence

20250509 15:59:00

<220>

<223> random peptide library

<400> 50

Leu Asn Val Pro Pro Ser Trp Phe Leu Ser Gln Arg

1

5

10

<210> 51

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 51

Leu Asp Ile Thr Pro Phe Leu Ser Leu Thr Leu Pro

1

5

10

<210> 52

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 52

Leu Pro His Pro Val Leu His Met Gly Pro Leu Arg

1

5

10

<210> 53

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 53

Val Ser Lys Gln Pro Tyr Tyr Met Trp Asn Gly Asn

1

5

10

<210> 54  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 54  
Asn Tyr Thr Thr Tyr Lys Ser His Phe Gln Asp Arg  
1 5 10

<210> 55  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 55  
Ala Ile Pro Asn Asn Gln Leu Gly Phe Pro Phe Lys  
1 5 10

<210> 56  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 56  
Asn Ile Glu Asn Ser Thr Leu Ala Thr Pro Leu Ser  
1 5 10

<210> 57  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 57



Tyr Pro Tyr Asp Ala Asn His Thr Arg Ser Pro Thr  
1 5 10

<210> 58

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 58

Asp Pro Ala Thr Asn Pro Gly Pro His Phe Pro Arg  
1 5 10

<210> 59

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 59

Thr Leu Pro Ser Pro Leu Ala Leu Leu Thr Val His  
1 5 10

<210> 60

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 60

His Pro Gly Ser Pro Phe Pro Pro Glu His Arg Pro  
1 5 10

<210> 61

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 61

Thr Ser His Thr Asp Ala Pro Pro Ala Arg Ser Pro  
1 5 10

<210> 62

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 62

Met Thr Pro Ser Ser Leu Ser Thr Leu Pro Trp Pro  
1 5 10

<210> 63

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 63

Val Leu Gly Gln Ser Gly Tyr Leu Met Pro Met Arg  
1 5 10

<210> 64

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 64

Gln Pro Ile Ile Ile Thr Ser Pro Tyr Leu Pro Ser  
1 5 10

<210> 65

<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 65  
Thr Pro Lys Thr Met Thr Gln Thr Tyr Asp Phe Ser  
1 5 10

<210> 66  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 66  
Asn Ser Gly Thr Met Gln Ser Ala Ser Arg Ala Thr  
1 5 10

<210> 67  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 67  
Gln Ala Ala Ser Arg Val Glu Asn Tyr Met His Arg  
1 5 10

<210> 68  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 68  
His Gln His Lys Pro Pro Pro Leu Thr Asn Asn Trp

1

5

10

<210> 69

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 69

Ser Asn Pro Trp Asp Ser Leu Leu Ser Val Ser Thr  
1 5 10

<210> 70

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 70

Lys Thr Ile Glu Ala His Pro Pro Tyr Tyr Ala Ser  
1 5 10

<210> 71

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 71

Glu Pro Asp Asn Trp Ser Leu Asp Phe Pro Arg Arg  
1 5 10

<210> 72

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

63354001

<223> random peptide library

<400> 72

His Gln His Lys Pro Pro Pro Leu Thr Asn Asn Trp  
1 5 10

<210> 73

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 73

Gly Val Val Gly Lys Leu Gly Gln Arg Arg Thr Lys Lys Gln Arg Arg  
1 5 10 15  
Gln Lys Lys

<210> 74

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 74

Gly Arg Arg Thr Lys Lys Gln Arg Arg Gln Lys Lys Pro Pro Arg Tyr  
1 5 10 15  
Met Ile Leu Gly Leu Leu Ala Leu Ala Ala Val Cys Ser Ala Ala  
20 25 30

<210> 75

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 75

Gly Arg Arg Thr Lys Lys Gln Arg Arg Gln Lys Lys Pro Pro  
1 5 10

<210> 76  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 76  
Met Tyr Arg Pro Pro Ala Ala Asn Val Asp Pro Trp  
1 5 10

<210> 77  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 77  
Ser Ser Pro Pro Pro Asp Leu Thr Thr Arg Thr Pro  
1 5 10

<210> 78  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 78  
Ala Thr Thr Gln Ser Thr Pro Pro Ala Phe His Leu  
1 5 10

<210> 79  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 79

Ser Asp Leu Pro His Val Ser Ser Tyr Trp Arg Gly  
1 5 10

<210> 80

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 80

Thr Thr Thr Gln Phe Met Glu Ile Arg Gln Ser Ala  
1 5 10

<210> 81

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 81

Gly Lys Thr Trp Lys Ala Ser Asp Glu Asp Trp Thr  
1 5 10

<210> 82

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 82

Asp Pro Ala Arg Ile Leu Gly Arg Ile Phe Leu  
1 5 10

<210> 83

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 83

Tyr Asn Leu Gln Pro Thr Thr Ser Ala Arg Pro Thr  
1 5 10

<210> 84

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 84

Ser Leu Lys Thr Pro Thr Thr Ser His Leu Ser Gln  
1 5 10

<210> 85

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 85

Thr Phe Asp Leu Arg Asn Asn Thr His Arg Asn Pro  
1 5 10

<210> 86

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> random peptide library

<400> 86

Ser Val Ser Val Gly Met Lys Pro Ser Pro Arg Pro  
1 5 10





<400> 90  
Arg Arg Arg Arg Arg Arg Arg Arg Arg Arg  
1 5 10

<210> 91  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 91  
Arg Arg Arg Arg Arg Arg Arg Arg Arg Arg Arg Arg  
1 5 10

<210> 92  
<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 92  
Lys Lys Lys Lys  
1

<210> 93  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 93  
Lys Lys Lys Lys Lys Lys  
1 5

<210> 94  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 94  
Lys Lys Lys Lys Lys Lys Lys Lys  
1 5

<210> 95  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 95  
Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys  
1 5 10

<210> 96  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 96  
Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys  
1 5 10

<210> 97  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 97  
Arg Arg Gln Arg Arg  
1 5

633200

<210> 98  
<211> 8  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 98  
Arg Arg Gln Arg Arg Gln Arg Arg  
1 5

<210> 99  
<211> 11  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> random peptide library

<400> 99  
Arg Arg Gln Arg Arg Gln Arg Arg Gln Arg Arg  
1 5 10

2025.04.04 10:00:00